

# The Portal

Official Newsletter of the Northern Gulf Institute



[www.NorthernGulfInstitute.org](http://www.NorthernGulfInstitute.org)



To submit info or ideas for upcoming newsletters, send an email to: [newsletter@NorthernGulfInstitute.org](mailto:newsletter@NorthernGulfInstitute.org).

## 4<sup>th</sup> Annual NGI Conference Highlights Collaborative, Relevant Research

*Event fosters coordinated and integrative science and initiates oil spill response*

The Northern Gulf Institute hosted 180 regional scientists, researchers, and students at their 4<sup>th</sup> annual conference in Mobile, AL, on May 18 – 20, 2010. This year’s conference highlighted the work of multi-university teams and partners. NGI’s established regional relationships and team mindset made for the successful addition of a Special Topics Session that convened Gulf of Mexico ecosystem experts to discuss coordinated research, response, and planning efforts for the Deepwater Horizon incident.



The NGI Poster Session is a popular event at annual conferences that combines formal and informal sharing of research.

The opening plenary session featured three regional science experts. Geoff Scott with the NOAA Center for Coastal Environmental Health and Biomolecular Research talked about coastal research; Miki Schmidt with the NOAA Coastal Services Center described the Digital Coast Partnership; and Larry McKinney with the Harte Research Institute discussed coastal marine spatial planning and its connection with the Gulf of Mexico Alliance. Concurrent sessions of thirty-six technical presentations covered topics of Nutrients and Habitats; Fisheries; Tools, Observation, and Management; Modeling; Food Webs; and Social Science and Education and Outreach.

An interactive poster session, included with an evening reception, had forty-eight displays that detailed current Gulf of Mexico research. Photo and student poster contests produced exceptional demonstrations of artistic, technical, and scientific efforts. The NOAA Career Roundtable hosted a panel of NOAA scientists and administrators who shared their professional experiences and discussed career opportunities with students.



NGI graduate student researcher, Allison Mojzis (USM), describes the research depicted on her poster about bacterioplankton impacts on water quality.

The NGI Program Office extends thanks to all participants who helped make this year's conference an exceptional success! To view this year's presentations, posters, and contest winning photos, please visit the NGI 2010 Conference Information at [www.northerngulfinstitute.org](http://www.northerngulfinstitute.org).

### NGI Teams Identify Key Science Needs for Deepwater Horizon Response

*Gulf of Mexico ecosystem experts gather at conference to discuss coordinated efforts*

NGI and NOAA scientists participated in a Special Oil Spill Session during their annual conference to address key scientific areas and questions in response to the Deepwater Horizon incident. The research questions and resultant teams represented the compilation of input from seventy Gulf of Mexico scientists and feedback of additional regional experts. The question posed to the assembled group was: "Given the events of the past months, what would you have wanted to see in place in the Gulf of Mexico in the areas of (a) data/monitoring, (b) modeling, and (c) assessment?" The scientists were also asked to identify near-, mid-, and long-term science regional needs and questions for these three areas.



Mike Carron, NGI Interim Director, speaks with media about NGI regional expertise and response to the Deepwater Horizon incident.

The data/monitoring session identified the need for compilation and ready access of past relevant data as well as the immediate and continuing collection of future

data. The modeling session identified needs in the larger issues of conceptual, physical, biogeochemical, and coupled modeling to explore aspects related to scientific understanding of data. The assessment session focused on specific needs identified as relevant to real world applications of science such as forecast systems, decision tools, and visualization. Two overarching needs highlighted during this process included data integration within and among the groups addressing the questions and a region-wide approach (such as common protocols and coordinated sampling) in seeking answers.

### NGI Conference Photo & Poster Contest



Overall Winning Photo - Student Category  
1st Place Landscape/Seascape  
Ryan Vandermeulen, USM



Overall Winning Photo - Researcher Category  
1st Place Landscape/Seascape  
Chris Gardner, NOAA

#### Student Photo Contest Awards:

- 1<sup>st</sup> Place Coastal Activities: Matt Dornback, USM
- 1<sup>st</sup> Place Flora/Fauna: Ranjit Jadhav, LSU
- 1<sup>st</sup> Place NGI at Work: Derek Cox, DISL

#### Researcher Photo Contest Awards:

- 1<sup>st</sup> Place Coastal Activities: Chris Gardner, NOAA
- 1<sup>st</sup> Place Flora/Fauna: Christina Schobernd, NOAA
- 1<sup>st</sup> Place NGI at Work: Chet Rakocinski, USM

#### Student Poster Contest Awards:

- 1<sup>st</sup> Place Jibonananda Sanyal, MSU
- 2<sup>nd</sup> Place Steven Scyphers, DISL
- 3<sup>rd</sup> Place Austin Todd, FSU

To view all winning photos and posters, please go to NGI 2010 Conference Info at [www.northerngulfinstitute.org](http://www.northerngulfinstitute.org).

## Student Interns Kick-Off Summer Activities at NGI Conference

*Future scientists engage with regional research community and like-minded peers*

The 2010 NOAA-NGI Diversity Interns began their summer work at this year's NGI conference and attended two student-specific events. Metadata Training, conducted by Kathy Martinolich from NOAA National Coastal Data Development Center, introduced the MERMAid (metadata enterprise resource aid) tool used to create metadata records. The NOAA Career Roundtable, moderated by NOAA NGI Science Coordinator Julien Lartigue, provided students an informal question and answer session about professional experiences and career opportunities.



Summer interns socialize during a conference break. L to R: Alexander Cruz Benitez, Carina Lopez Cabrera, Trent Key, Hua Wang, Rebecca Doss.

Panel members for the NOAA Career Roundtable included:

**Geoff Scott**, Director, NOAA Center for Coastal and Environmental Health and Biomolecular Research

**John Cortinas**, Director, NOAA Office of Oceanic and Atmospheric Research's CI Program

**David Reed**, Hydrologist in Charge, NOAA Lower MS River Forecast Center

**David Evans**, Research Chemist, NOAA Center for Fisheries and Habitat Research

**Marian Hanisko**, Coastal Management Specialist, Contractor Coastal Services Center

**Colleen Rochelle**, Chemist, Contractor Center for Fisheries and Habitat Research

## NOAA-NGI Diversity Summer Interns' Thoughts about NGI Annual Conference

*I enjoyed interacting with others who shared the same interest as myself. I would have to say that the career fair was the most beneficial to me. I networked and collected a few business cards from individuals after the round table career fair. I met David Reed the hydrologist in charge at the NWS office in Slidell and plan to volunteer at the NWS Office in Jackson and get more pointers on how to apply for the SCEP Program. – Breawna Kirkpatrick, Jackson State University, Meteorology undergraduate student interning at the Mississippi Department of Environmental Quality*

*I had chance to [participate in] certain talks that I was not familiar with and it truly enlighten me. . . .I did not know [modeling] was a very praise area in science and gave me ideas to incorporate some aspect of it in my future studies. I mostly talk to people in the modeling and that where ideas started to flourish for me. I also enjoyed the session on the Oil spill where everyone was brain storming, it let you appreciate how future project can start with an Ah..Ha moment. – Idrissa Boube, University of Southern Mississippi, Disease Transmission/Resistance in Penaeid Shrimp interning at the Gulf Coast Research Laboratory*

*The duration of breaks allowed for additional discussion with presenters and fellow attendees. I found all the sessions I attended (Social Science and Education and Outreach, Fisheries I and II, and Deepwater Horizon Incident) to be interesting and beneficial. I'm glad I had the opportunity after the sessions to speak in more detail with Ross Moore and Tina Miller-Way about their presentations and programs. I even had some lively discussions with individuals during meals. The NOAA Career Roundtable was informative, and the metadata training I received has proven helpful with my project. – Jason James, University of Louisiana at Lafayette, Marine Biology/Fisheries interning at NOAA Office of Coast Survey*

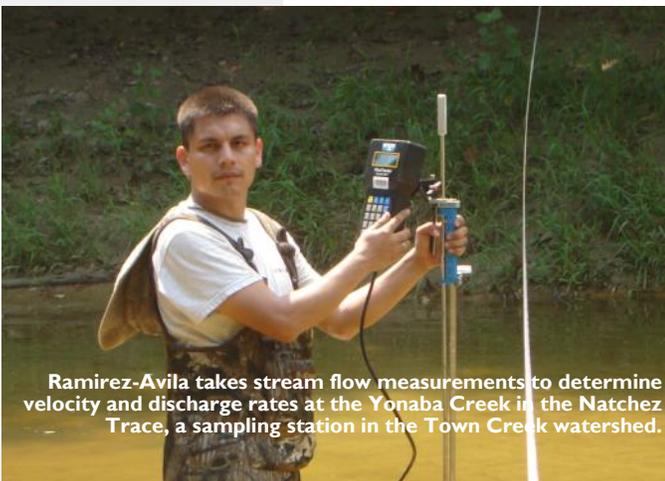
*The NGI annual meeting was extremely well organized and represented a wide field and the latest scientific research direction. Dr. Petrolia and I talked about how to consider some important variables-time and risk- in economic analysis, which are very useful for my research. Coffee break and lunch gave me an excellent opportunity to exchange ideas and to communicate with others. Also, poster part gave me a chance to review different topic and some of the topics we missed. – Hua Wang, Louisiana State University, Agriculture Economics interning at the LSU Center for Natural Resource Economics and Policy*

## STUDENT SPOTLIGHT

### NGI MSU Graduate Student Researcher Receives 1<sup>st</sup> Place Award in National Competition

*Sediment transport in the watershed is focus of research*

John J. Ramirez-Avila, a Ph.D. student in Civil and Environmental Engineering and with the Geosystems Research Institute at MSU, won first place in the National American Society of Civil Engineering Environmental Water and Resources Institute Technical Paper Student Competition. Ramirez-Avila's paper titled "Suspended Sediment Transport in a Southeastern Plains Watershed" explains his research for the NGI-funded project, Modeling Mobile Bay Sediments and Pollutants with New Technologies, and it provides preliminary results from the first year of his research.



Ramirez-Avila takes stream flow measurements to determine velocity and discharge rates at the Yonaba Creek in the Natchez Trace, a sampling station in the Town Creek watershed.

The goal of Ramirez-Avila's research is to determine sediment sources within the Town Creek watershed, a representative area within the Tombigbee River Basin and the Southeastern Plains Ecoregion. He presented an analysis of suspended sediment monitoring and field recognition procedures along the Town Creek watershed in order to identify trends and drivers of sediment supply and movement. The research focused on the identification, assessment, evaluation, and prediction of stream bank erosion processes within this watershed area, which supplies significant quantities of sediment to Mobile Bay and the Gulf coast. To view the presentation, go to [http://www.ngi.msstate.edu/2010ngiconference/Presentations/John\\_Ramirez\\_Avila/](http://www.ngi.msstate.edu/2010ngiconference/Presentations/John_Ramirez_Avila/).

Ramirez-Avila works on this project with Principal Investigator Bill McAnally (NGI Co-Director) and with Co-Principal Investigators David W. Evans (NOAA Center for Coastal Fisheries and Habitat Research), James Martin (MSU Department of Civil and Environmental Engineering), and Karen McNeal (MSU Department of Geosciences). The paper and award were presented at the 2010 World Environmental and Water

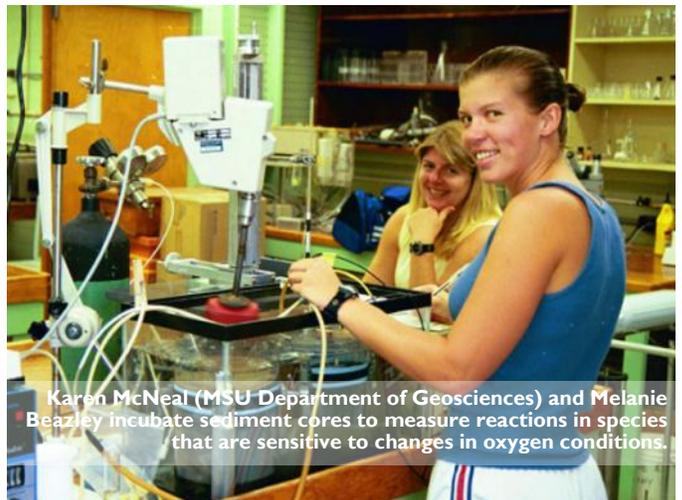
Resources Congress Conference in Providence, RI on May 19. James Martin, co-advisor for Ramirez-Avila, received the award on his behalf because another important event took precedence: the birth of Ramirez-Avila's son, Santiago. Congratulations, John!

## RESEARCH SPOTLIGHT

### NGI Studies Contaminants that Impact Water Quality

*Sediment transport to coastal waters is focus of research*

Maintaining healthy fish stocks is of great importance to the Gulf coastal region and understanding how toxins enter coastal waters is a key component to managing the quality of the seafood we eat. Sediments in waterways that flow into the Gulf are primary transports of organic and inorganic matter, such as nutrients that produce algae and toxins that enter fisheries food webs. Knowledge about where and how matter enters into watershed sediments can help resource managers make decisions and take actions to keep our coastal waters safe and healthy.



Karen McNeal (MSU Department of Geosciences) and Melanie Beazley incubate sediment cores to measure reactions in species that are sensitive to changes in oxygen conditions.

NGI researchers at MSU, in collaboration with NOAA Center for Coastal Fisheries and Habitat Research and support from the Geological Society of America and the National Sedimentation Laboratory in Oxford, MS, are working to better understand and predict the path and fate of sediment in the Gulf coastal region from entry point to fish stocks. Building upon two previous NGI-funded projects, Mobile Bay Sediment Modeling and Mercury Bioaccumulation in Mobile Bay, researchers are extending the model for use of the coastal Gulf of Mexico.

The redistribution of sediments is a critical determinant of where mercury and other organic matter may cause problems in the coastal environment. Sediment characteristics such as texture and content help deter-

mine the extent to which inorganic mercury is transformed to methylmercury, a more toxic form of mercury that is absorbed through food webs. Algae production from high concentrations of nutrients (eutrophication) is another source of sediment-deposited organic matter which contributes to hypoxia and stimulates mercury methylation. Researchers want to study nutrients that could reduce the production of methylmercury as another means to improve water quality. Better methods of predicting where sediment transport of matter enters and moves through the watershed may improve the Gulf waters of our fish stocks. For more information about this research, contact Bill McAnally at [mcanally@ngi.msstate.edu](mailto:mcanally@ngi.msstate.edu).



Kristen Laursen, NOAA Gulf of Mexico Regional Coordinator, facilitates a working session on fisheries research and management needs.

## NGI & NOAA Host Workshop on Gulf of Mexico Hypoxic Zone Research

*Sessions focused on coordination of research*

In mid-February, NGI and NOAA's National Centers for Coastal Ocean Science, National Coastal Data Development Center, and Gulf of Mexico Regional Collaboration Team brought together about 85 leading regional researchers and resource managers for the Workshop to Coordinate Gulf of Mexico Hypoxic Zone Research in Bay St. Louis, MS. The goal of this two-day workshop was to develop a plan to increase collaborations, coordinate hypoxia monitoring activities, and ensure that researchers and resource managers are aware of available monitoring surveys.

Bill Walker, Director of MS Department of Marine Resources, emphasized the importance of these sessions for regional decision makers and researchers. Participants engaged in work groups on 1) Impacts of the hypoxic zone on living resources with a focus on fisheries and 2) Plans to improve hypoxic zone monitoring. The results of this workshop were used to

develop a draft FY10 Hypoxic Zone Monitoring Coordination Plan. Preparations began for the development of the 2010 Gulf Hypoxic Zone Monitoring Implementation Plan, the National Hypoxia Data Management System, and the Gulf Hypoxia Communications Plan.

## NGI Participates in CREST Workshop on Coastal Research in Mississippi

*Public preference included in topics on restoration and protection efforts*

The Coastal Restoration and Enhancement through Science and Technology (CREST) held a workshop in March at the Gulf Coast Research Lab in Ocean Springs, MS that covered three topics on restoration and protection: saltmarsh restoration, subsidence of the Pearl River Delta, and economic assessment of coastal restoration techniques.

NGI PI and CREST member Dan Petrolia with MSU talked about challenges in understanding public preferences for coastal restoration and assessing benefits of restoration. He presented survey results and conclusions based on responses about the public's willingness to pay for restoration and also offered future research suggestions on: 1) encouraging choices based on correct perceptions and 2) understanding decision-making processes about use and non-use of mitigation tools. For more information on this research, contact Dan Petrolia at [Petrolia@agecon.msstate.edu](mailto:Petrolia@agecon.msstate.edu).

## NGI Attends Workshop on Sea Level Rise Education and Outreach

*Regional efforts focus on creating a "storm smart" community of practice*

In late March, city resource managers and planners from the Gulf region met with extension and outreach and education professionals, scientists, and communications specialists in St. Pete Beach, FL. Their purpose was to help communities understand sea-level rise and its consequences. Participants discussed gauging community opinion about climate change and sea-level rise and identified groups that are asking for information and who are ready to take action. Other topics included use of community-based social marketing and education and outreach actions that would help communities plan for sea-level rise such as developing a simple message, having sea-level rise included when determining flood maps, creating a sea-level rise visualization tool, and having officials incorporate these into their community planning efforts.

The Gulf of Mexico Sea Grant programs, NOAA Coastal Services Center, NOAA Gulf of Mexico Regional Collaboration Team, and the Gulf of Mexico

Extension, Outreach and Education Engagement Pilot Program organized the event. The Climate Outreach Community of Practice group has a social network at [www.stormsmartconnect.org](http://www.stormsmartconnect.org) and invites participation.

## NGI Supports 2010 CNREP Conference

*Socioeconomic issues included in oil spill topics*

The Challenges of Natural Resource Economic and Policy Conference held in New Orleans, LA in late May is part of the National Forum on Socioeconomic Research in Coastal Systems. NGI provided support for student researchers to participate in this year's conference where social scientists interested in coastal and marine issues shared their research and outreach activities in the areas of natural resource economics and policy. NGI researcher Dan Petrolia (Environmental and Natural Resource Economics, MSU) served on the program committee and participated in the poster session. Session highlights included "Perspectives of Coastal Changes and Resilience from Alaska and Louisiana Community Citizens," "Understanding Fisheries Management," and "The Horizon Oil Spill: Economic Assessment and Extension Challenges."

## MSU Science and Technology Center

*Groundbreaking ceremony at Stennis Space Center*

On May 3<sup>rd</sup>, the groundbreaking took place for the Mississippi State University Science and Technology Center which will be built at NASA's John C. Stennis Space Center. The Honorable Thad Cochran, U.S. Senator, was the keynote speaker and was accompanied by dignitaries and state leaders in the ceremony. David Shaw, MSU Vice President for Research and Economic Development and former NGI Director, said that the new center will enhance the abilities of MSU, NGI, and its member partners to address pressing needs of this region.



L to R: Jeffery Barns, partner in Dale and Associates Architects; David Shaw, MSU Vice President for Research and Economic Development; Sally Yozell, NOAA Director of Policy; U.S. Senator Thad Cochran, R-MS; Mark Keenum, MSU President; U.S. Representative Gene Taylor, D-MS; Patrick Scheuermann, Stennis Director; and Ed Blakeslee, MS IHL board member.

The 40,000 square foot facility will be the new home for the NGI Program Office, NOAA National Coastal Data Development Center, and MSU Geosystems Research Institute researchers. NOAA provided funding for the building, which represents a partnership and commitment for continued research and education and outreach programs.

## NEWS AROUND NGI

### eNGIS Tool Maps Data and Research Activities in Northern Gulf of Mexico

NGI researchers at MSU launched the Enterprise Northern Gulf Information System – eNGIS – a tool for those interested in finding out what data are available or where research activities are taking place in the northern Gulf of Mexico region. eNGIS is a foundational information system with the ultimate goal of being a complete enterprise system which takes an organizational approach to sharing, using, and managing information. This tool provides an easy access point to look at information such as trajectories, navigational charts, and environmental sensitivity indices with other base map information. Users without GIS skills or software can look at multiple layers of data and perform simple query and identification tasks without having to find individual pieces of data. For more information, please contact John Cartwright at [johnc@ngi.msstate.edu](mailto:johnc@ngi.msstate.edu).

### NGI Program Office Provides Support and Development for the Gulf of Mexico Alliance Website

In early spring 2010, the Gulf of Mexico Alliance requested that NGI extend its web support and development activities to include the entire GOMA website [gulfofmexicoalliance.org](http://gulfofmexicoalliance.org). NGI was already providing hosting and technical support for the GOMA Environmental Education Network's (GOMEEN) website and the GOMA Diversity website. NGI handles technical issues for the GOMA websites, and the work of Suzanne Shean and Gabriel Brackman was recognized for its quality and efficiency at the NGI Advisory Council's meeting last fall. Discussions ensued that led to the request for NGI to handle GOMA's web presence. For more information about NGI's role with the GOMA website, please contact Jay Ritchie, NGI Social Science and Education and Outreach Coordinator, at [jritchie@ngi.msstate.edu](mailto:jritchie@ngi.msstate.edu).

## NGI Researchers at LSU have Work Published in Scientific Journal

Ana C. Garcia, a graduate student with the LSU Department of Oceanography and Coastal Sciences whose research is supported by NGI and Louisiana Sea Grant, is the primary author of *Evaluating the potential risk of microcystins to blue crab (*Callinectes sapidus*) fisheries and human health in an eutrophic estuary* which was published in the Harmful Algae Journal (Volume 9, Issue 2, February 2010). Secondary authors include two other NGI LSU scientists and faculty, Sibel Bargu and Malinda Sutor. This research was conducted in a freshwater lake, Lac des Allemands, located in the Barataria estuary system of southeastern Louisiana and documented toxins in surface water and in blue crabs taken from this region that could be transferred to humans. Garcia will be a Ph.D. student in the coming fall and continue her studies at the Dauphin Island Sea Lab.

## NGI Scientists at FSU Provide Assistance for Florida's Response to Oil Spill

NGI scientists at the Center for Ocean-Atmospheric Prediction studies and from the Coastal and Marine Laboratory helped establish the Oil Spill Academic Task Force, a consortium of scientists and scholars from fifteen Florida universities working in collaboration with the Florida Department of Environmental Protection (<http://oilspill.fsu.edu>). One of this group's efforts produced an "Expert Finder" database for identifying and contacting scientists and scholars by research area who are affiliated with Florida universities (<http://oilspill.fsu.edu/expertfinder.php>).

FSU oceanographers and NGI PIs Steve Morey and Dmitry Dukhovskoy are using the HYbrid Coordinate Ocean Model to provide seven-day forecast animations for the oil spill region. These forecasts are updated weekly at [http://deepwaterhorizon.fsu.edu/projections/hycom/hycom\\_gfs.html](http://deepwaterhorizon.fsu.edu/projections/hycom/hycom_gfs.html).

## NGI Scientists and Researchers Get First-Hand Look at Deepwater Horizon Oil Spill

NGI scientists and researchers visited the Deepwater Horizon incident site and its affected areas on June 26, 2010 courtesy of the Mississippi Air National Guard. The Guard seeks to help scientists, decision makers, and media have a better sense of what is occurring in the Gulf.

Warner McBride, MS Representative District 10, was also on this flight and asked about scientists' concerns. NGI Fellow and PI Steven Lohrenz (USM) noted that

the oil sheen was more evident south of the barrier islands than he had seen on a previous site visit – a precursor to the now oiled beaches of the Gulf States. He also expressed concern about the uncertainty of in-shore effects on movement of oil when a storm enters anywhere in the Gulf. NGI PI Tina Miller-Way (DISL) emphasized the importance to support and use local and regional expertise to its best extent. The group also explained the need for a coordinated science response and noted that NGI was created in 2006 for the purpose of science collaboration among the gulf region's research institutions and has an established successful partnership.



## SUBMIT TO FUTURE ISSUES OF THE NEWSLETTER:

We invite you to send any newsworthy items to be included in upcoming issues. Please send your submissions to: [newsletter@NorthernGulfInstitute.org](mailto:newsletter@NorthernGulfInstitute.org). We encourage you to include any photographs or images with your articles to make them more interesting.

## Subscribe to the NGI Listserve:

To subscribe to the NGI mailing list, submit "subscribe ngi" in the text body of a message to: [majordomo@NorthernGulfInstitute.org](mailto:majordomo@NorthernGulfInstitute.org) with no subject indicated.

## Dear NGI community,

The Deepwater Horizon (DwH) tragedy makes it seem like the world has shifted from under our feet. Yet, it is essential that as we address this tragedy, we maintain the core focus areas of NGI and continue our leadership in coordinated, collaborative research in the Gulf of Mexico. This focused grounding allows us, as a group, to quickly adapt to address priority issues.

Since our last Portal, your Program Office has been extremely active in growing our partnerships and demonstrating our leadership role in the Gulf region. The conferences and workshops mentioned in this newsletter are just a few of the dozen or more that we supported. NGI continues to provide significant support to the governors' Gulf of Mexico Alliance and is actively engaged with the NOAA Gulf of Mexico Regional Collaboration Team.

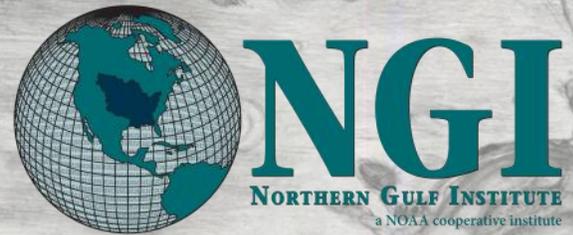
Our fourth annual conference in May exhibited the transition between the first phase of our research (years 1 – 3) and early results of our second phase (years 4 and 5). The quality of the presentations and posters was excellent and we all benefited from face-to-face interactions with our friends in the NGI community. The Council of Fellows and Program Office senior staff continued work on our revised Strategic Plan to guide us for our next five years. We anticipate more focused efforts on a few major coordinated research initiatives including integrative ecosystem assessments and coastal marine spatial planning. Oil impacts on the Gulf's ecosystems will be incorporated in our planning.

Recognizing the importance of the DwH event, our conference included a full morning session to discuss short and long-term research priorities with our science experts and visitors from the emergency operations center in Mobile. Our coordinated planning response addresses eighteen major research questions, preparing us to respond to future proposal requests from funding agencies. NGI was selected by BP, along with the Florida Institute of Oceanography and LSU, to receive emergency research funding to continue vital field operations until a more stable research funding base is established. NGI will continue to work with our partners and agencies to address the evolving research issues associated with the DwH incident.

The ongoing events provide NGI the opportunity to use its intellectual capacity to measure, model, analyze and help coastal zone managers make informed decisions to protect this vital region of the United States. Working with our partners at the Governors' Action Plan II Implementation and Integration Workshop and at the upcoming Restore America's Estuaries Conference in November strengthens our collaborative efforts.

Mike Carron

NGI Interim Director



### NGI Administrative Office:

Box 9652  
Mississippi State, MS 39762  
Ph: 662-325-9573  
Fax: 662-325-7692

### NGI Program Office:

Building 1103, Room 233  
Stennis Space Center, MS 39529

This newsletter was prepared under award NA06OAR4320264 06111039 to the Northern Gulf Institute by the NOAA Office of Ocean and Atmospheric Research, U.S. Department of Commerce. The Northern Gulf Institute and its academic members do not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation or group affiliation, age, handicap/disability, or veteran status.



The Northern Gulf Institute is a member institute of the High Performance Computing Collaboratory

Photos courtesy of the Northern Gulf Institute.